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IS : 4304 - 1976

Indian Standard
SPECIFICATION FOR TUNA CANNED IN OIL
(*First Revision*)

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INDIAN STANDARDS INSTITUTION
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
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Indian Standard

SPECIFICATION FOR TUNA CANNED IN OIL

(*First Revision*)

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AMENDMENT NO. 1 APRIL 1998
TO
IS 4304 : 1976 SPECIFICATION FOR TUNA
CANNED IN OIL

(*First Revision*)

(*Page 4, clause 3.2.2, line 1*) — Substitute 'IS 594 : 1981†' for 'IS : 594 - 1962†'.

(*Page 4, footnote marked '†'*) — Substitute '(*second revision*)' for '(*revised*)'.

(*Page 6, Table 1*) — Substitute the following for the existing table:

Table 1 Chemical and Microbiological Requirements
for Tuna Canned in Oil

Sl No.	Characteristic	Requirement	Method of Test, Ref to
(1)	(2)	(3)	(4)
i)	Arsenic, mg/kg, <i>Max</i>	1.1	L-5 of IS 2237 : 1997*
ii)	Lead, mg/kg, <i>Max</i>	1.0	L-6 of IS 2237 : 1997*
iii)	Copper, mg/kg, <i>Max</i>	10.0	L-4 of IS 2237 : 1997*
iv)	Zinc, mg/kg, <i>Max</i>	50.0	L-4 of IS 2237 : 1997*
v)	Tin, mg/kg, <i>Max</i>	250.0	L-7 of IS 2237 : 1997*
vi)	Mercury, mg/kg, <i>Max</i>	0.5	L-3 of IS 2237 : 1997*
vii)	Microbiological activity	To satisfy the requirement of the test	G of IS 2168 : 1971†
viii)	Histamine content, mg/100g fish meat, <i>Max</i>	20.0	B of IS 4793 : 1997 ‡

*Prawns (shrimp) — Frozen — Specification (*third revision*)

†Specification for pomfret canned in oil (*first revision*).

‡Pomfret — Frozen — Specification (*second revision*).

Indian Standard

SPECIFICATION FOR TUNA CANNED IN OIL

(First Revision)

0. FOREWORD

0.1 This Indian Standard (First Revision) was adopted by the Indian Standards Institution on 30 April 1976, after the draft finalized by the Fish and Fisheries Products Sectional Committee had been approved by the Agricultural and Food Products Division Council.

0.2 Canned tuna promises a vast scope for the development of the internal trade of this commodity. Besides, there is also good international market for canned tuna, if proper quality control measures are taken. The formulation of this Indian Standard has been considered necessary in order to help in exercising proper quality control.

0.3 The standard was first published in 1967. The present revision incorporates a number of important modifications, namely, (a) the species of tuna not suitable for canning have been deleted, (b) the salt content of the canned chunks and flakes has been restricted to 2 percent, (c) the requirement for vacuum has been relaxed, and (d) methods of test have been referred to an up to date revision of the standard.

0.4 In the preparation of this specification, due consideration has been given to the provisions of the Prevention of Food Adulteration Act, 1954 and the Rules framed thereunder. However, this standard is subject to the restrictions imposed under this Act, wherever applicable.

0.5 For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS:2-1960*. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

1. SCOPE

1.1 This standard prescribes the requirements and the methods of sampling and test for tuna canned in oil.

*Rules for rounding off numerical values (revised).

1.1.1 The term 'tuna' shall apply to the following species of fish:

<i>Common English Name</i>	<i>Zoological Name</i>
a) Yellow fin tuna	<i>Thunnus albacares</i> syn. <i>Neothunnus</i> (Bonn) <i>macropterus</i> ; <i>Neothunnus itosibi</i>
b) Albacore	<i>Thunnus alalunga</i> (Bonnaterre)
c) Blue fin tuna	<i>Thunnus thynnus</i> syn. <i>Thunnus thynnus ori-</i> <i>entalis</i> (Temminck and Schlegel)
d) Big eye tuna	<i>Thunnus mebachi</i> syn. <i>Parathunnus obesus</i> <i>mebachi</i>
e) Northern blue fin tuna	<i>Thunnus tonggol</i> syn. <i>Kishinoella tongga</i>
f) Oceanic skip jack	<i>Katsuwonus pelamis</i> (Linn.)

2. TERMINOLOGY

2.0 For the purpose of this standard, the following definitions shall apply.

2.1 Large Chunks — Large pieces of pre-cooked tuna taken from fillets of healthy fish.

2.2 Medium Chunks — Medium pieces of pre-cooked tuna taken from fillets of healthy fish.

2.3 Flakes — Small pieces of pre-cooked tuna which do not fall under the category of large or medium chunks.

3. REQUIREMENTS

3.1 Hygienic Requirements — The material shall be prepared, filled and processed under hygienic conditions and only in premises maintained in a thoroughly clean and hygienic manner [see IS:4303 (Part II)-1975*] and duly approved or licensed by the concerned authorities.

3.2 Raw Materials

3.2.1 Fish — The raw material used for preparation of canned tuna shall be fresh or frozen, sound, wholesome fish, properly cleaned and free from entrails.

3.2.2 Salt — Only refined salt conforming to IS:594-1962† shall be used for canning.

*Code of hygienic conditions for fish industry: Part II Canning stage (first revision).

†Specification for common salt for fish curing (revised).

3.2.3 Oil — Only double refined, pure, clear and deodourized edible vegetable oil having colourless appearance or light golden yellow colour shall be used for canning tuna. The oil shall be free from any foreign matter or mineral oils and objectionable flavour. The free fatty acid content of the oil shall be less than one percent.

3.3 Preparation — Tuna, after dressing, shall be properly pre-cooked and the meat freed from skin, bones and large streaks of red meat, drained; dry-salted (3.2.2); and packed into cans with oil (3.2.3). If necessary, additives, such as monosodium glutamate, or cloves and black pepper, whole, may be added.

3.3.1 Form — Tuna meat may be canned in any one of the following forms:

- a) Large chunks,
- b) Medium chunks, or
- c) Flakes.

3.3.1.1 When packed in the form of flakes, the muscular structure of the flesh shall be retained.

3.4 Packing in Cans

3.4.1 The tuna shall be packed in suitable, hermetically sealed, round or flat rectangular (Dingley type) or oval cans. If the cans are lacquered, the lacquer used shall be of such quality that it does not impart any foreign taste and smell to the contents of the can and does not peel off during processing and storage of the product. The lacquer shall not be soluble in oil or brine to any extent. The cans shall be free from rust. The cans shall be thoroughly cleaned before filling.

3.4.2 The tuna pieces in any can shall be of fairly uniform size.

3.4.3 The red meat pieces of tuna, if canned separately from white pieces, shall be so labelled on the can.

3.5 Processing — Processing shall be at such temperature and for such length of time as to ensure adequate sterilization of the finished product without burning, scorching or overcooking. The water used for the cooling of cans shall be of potable quality and maintained in clean condition and chlorinated to maintain a minimum free residual chlorine concentration of 1 mg/kg.

3.6 Requirements for the Finished Product

3.6.1 Canned tuna shall have colour characteristic of the variety which may be either white, pink or light brown. The meat shall have a reasonably firm texture and shall have pleasant flavour and odour.

3.6.2 The contents of the can on opening shall not show any appreciable disintegration. Pieces from which portions have been separated out shall be treated as disintegrated units. The percentage of detached portions of fish calculated on the basis of the drained mass shall not exceed 5 percent by mass based on an average of 5 cans.

3.6.3 Vacuum — The can shall give a negative pressure when punctured and the vacuum shall be not less than 150 mm Hg in case of round cans when measured with an electric vacuum recorder or a vacuum gauge of the piercing type.

3.6.4 Drained Mass — The drained mass of the contents in each can shall be not less than 70 percent by mass of the water holding capacity of the can when tested by the method given in Appendix A of IS:2168-1971*.

3.6.5 The proportion of the brine in oil shall be not more than 5 percent (v/v) when determined by the method given in 2.7.6.1 of IS:2168-1971*.

3.6.6 The product shall be free from artificial colouring matter.

3.6.7 The salt content of the tuna chunks or flakes shall be not more than 2 percent, when determined by method in Appendix B of IS:3853-1966† taking 5 to 10 g of the material.

3.6.8 The material shall be free from any poisonous and deleterious substances and shall also conform to the chemical and microbiological requirements prescribed in Table 1.

**TABLE 1 CHEMICAL AND MICROBIOLOGICAL REQUIREMENTS
FOR TUNA CANNED IN OIL**

(Clause 3.6.8)

SL No.	CHARACTERISTIC	REQUIREMENT	METHOD OF TEST, (REF TO APPENDIX OF IS:2168-1971*)
(1)	(2)	(3)	(4)
i)	Arsenic, mg/kg, <i>Max</i>	1	B
ii)	Lead, mg/kg, <i>Max</i>	5	C
iii)	Copper, mg/kg, <i>Max</i>	10	D
iv)	Zinc, mg/kg, <i>Max</i>	50	E
v)	Tin, mg/kg, <i>Max</i>	250	F
vi)	Microbiological activity	To satisfy the requirements of the test	G

*Specification for pomfret canned in oil (*first revision*).

*Specification for pomfret canned in oil (*first revision*).

†Specification for dry-salted horse mackerels.

3.6.9 The cans shall be exhausted by heat, steam or mechanical process and sealed in hot condition by double seaming. The sealed cans shall be processed at such temperature and for such length of time as to ensure adequate sterilization of the finished product without burning, scorching or overcooking. The processed cans shall be cooled in water chlorinated to 1 mg/kg available chlorine.

3.6.9.1 The can exterior, specially seams shall be free from dents, rust, perforations and distortions. The cans shall not show leaking, panelling or swelling. The interior of the can on opening shall not show any visible black discolouration, rusting or pitting and the inside lacquer shall be in good condition.

4. PACKING AND MARKING

4.1 Packing — Unless agreed otherwise between the purchaser and the vendor, the cans shall be packed in cases sufficiently strong to withstand rough handling by rail, road and sea transport without damage to their contents.

4.2 Marking — The labelling of the cans may be done either by printing or lithographing on the cans themselves or by attaching labels printed on paper, subject to agreement between the purchaser and the vendor.

4.2.1 The labels shall give the following informations:

- a) Name of the material along with the form of pack with brand name, if any;
- b) Name and address of the manufacturer;
- c) Net mass of the contents of the can;
- d) Batch or lot number and the date of manufacture to be embossed in code on the can;
- e) The nature of the canning medium used and its ingredients;
- f) Licence number, date and authority, if any, under which the manufacturer has been permitted to can the product; and
- g) Other information required by the Packaged Commodities (Regulation) Order, 1975.

4.2.2 Each container may also be marked with the ISI Certification Mark.

NOTE — The use of the ISI Certification Mark is governed by the provisions of the Indian Standards Institution (Certification Marks) Act and the Rules and Regulations made thereunder. The ISI Mark on products covered by an Indian Standard conveys the assurance that they have been produced to comply with the requirements of that standard under a well-defined system of inspection, testing and quality control which is devised and supervised by ISI and operated by the producer. ISI marked products are also continuously checked by ISI for conformity to that standard as a further safeguard. Details of conditions under which a licence for the use of the ISI Certification Mark may be granted to manufacturers or processors, may be obtained from the Indian Standards Institution.

5. SAMPLING

5.1 The method of drawing representative samples of the material and the criteria for conformity shall be as prescribed in Appendix A.

6. TESTS

6.1 Tests shall be carried out as prescribed in 3.6.3, 3.6.4, 3.6.5 and in col 4 of Table 1.

A P P E N D I X A

(Clause 5.1)

SAMPLING OF TUNA CANNED IN OIL

A-1. GENERAL REQUIREMENTS OF SAMPLING

A-1.1 Sampling shall be done by a person agreed to between the purchaser and the vendor and in the presence of the purchaser (or his representative) and the vendor (or his representative).

A-1.2 Samples shall be stored in such a manner that the temperature of the material does not vary unduly from the normal temperature.

A-1.3 Samples may be tested at a laboratory agreed to between the purchaser and the vendor.

A-2. SCALE OF SAMPLING

A-2.1 Lot — In any consignment, all the cases containing cans of the same size and from the same batch of manufacture shall be grouped together to constitute a lot.

A-2.1.1 Samples shall be tested for each lot for ascertaining conformity of the material to the requirements of this specification.

A-2.2 The number of cases to be selected from each lot shall be in accordance with col 1 and 2 of Table 2.

A-2.3 The cases shall be selected at random. In order to ensure randomness of selection, random number tables shall be used. In case such tables are not available, the following procedure shall be adopted:

Starting from any case count them as 1, 2, 3,...up to r in a systematic manner. Every r th case thus counted shall be withdrawn, r being the integral part of N/n , where N is the total number of cases in the lot, and n number of cases to be selected till the requisite number is obtained.

TABLE 2 SELECTION OF PACKING CASES

(Clause A-2.2)

NO. OF CASES IN THE LOT	NO. OF CASES TO BE SELECTED
(1)	(2)
Up to 8	2
9 „ 25	4
26 „ 40	5
41 „ 65	6
66 „ 110	7
111 „ 180	8
181 „ 300	9
301 „ 500	10

A-2.4 From each of the cases selected as in A-2.2, draw one can for testing the physical and chemical requirements.

A-2.5 In addition to the cans selected as in A-2.4, eight cans shall be selected at random as far as possible from all the cases chosen (A-2.2) for testing microbiological activity.

A-3. NUMBER OF TESTS

A-3.1 Each of the cans selected as in A-2.4 for testing the physical and chemical requirements shall be tested separately for vacuum.

A-3.2 After testing for vacuum, the contents of all the cans shall be taken and mixed together to form a composite sample. The composite sample so formed shall be tested for heavy metals (Appendices B to F of IS:2168-1971*).

A-3.3 Tests for Microbiological Activity

A-3.3.1 Incubation at 37°C — Half of the cans selected (A-2.4) for testing the microbiological activity shall be incubated at 37°C for not less than 14 days and subjected to microbiological examination (Appendix G of IS:2168-1971*).

A-3.3.2 Incubation at 55°C — The remaining half of the cans shall be incubated at 55°C for not less than 4 days and subjected to microbiological examination (Appendix G of IS:2168-1971*).

*Specification for pomfret canned in oil (first revision).

A-4. CRITERIA FOR CONFORMITY

A-4.0 The lot shall be considered as conforming to the requirements of this specification if the criteria mentioned under A-4.1 to A-4.3 are all satisfied.

A-4.1 For Physical Requirements — The lot shall be declared as conforming to the physical requirements of vacuum and head space if all the individual samples tested (A-3.1) satisfy the requirements specified in 3.6.3 and 3.6.4.

A-4.2 For Chemical Requirements — For declaring the conformity of the lot to the chemical requirements regarding heavy metals, the test results on the composite sample (A-3.2) shall satisfy the relevant requirements specified in 3.6.8.

A-4.3 For Microbiological Activity — For declaring the conformity of the lot to microbiological activity, the test results (A-3.3.1 and A-3.3.2) shall satisfy the requirements specified in 3.6.8.

INDIAN STANDARDS ON FISH AND FISHERIES PRODUCTS

IS:

- 2168-1971 Pomfret canned in oil (*first revision*)
- 2236-1968 Prawns (shrimp) canned in brine (*first revision*)
- 2237-1971 Frozen prawns (shrimp) (*first revision*)
- 2345-1972 Dried prawns (*first revision*)
- 2420-1971 Mackerel (*Rastrelliger* sp) canned in oil (*first revision*)
- 2421-1971 Sardines (*Sardinella* sp) canned in oil (*first revision*)
- 2883-1976 Dried white baits (*Stolephorus* sp) (*first revision*)
- 2884-1964 Dried and laminated Bombay duck
- 2885-1975 Frozen frog legs (*first revision*)
- 3336-1965 Shark liver oil for veterinary use
- 3849-1976 Mackerel (*Rastrelliger* sp) canned in brine (*first revision*)
- 3850-1973 Dry-salted threadfin (*Dara*) and dry-salted jewfish (*Ghol*)
- 3851-1966 Dry-salted catfish
- 3852-1966 Dry-salted leather jackets (*Chorinemus* sp)
- 3853-1966 Dry-salted horse mackerels (*Caranx* sp)
- 3892-1975 Frozen lobster tails (*first revision*)
- 4302-1967 Dry-salted mackerel
- 4307-1973 Fish meal as livestock feed
- 4780-1968 Fresh silver pomfret and brown pomfret
- 4781-1968 Fresh threadfin
- 4793-1968 Frozen silver pomfret and brown pomfret
- 4796-1968 Frozen threadfin
- 5198-1969 Dry-salted seer fish
- 5199-1969 Dry-salted shark
- 5471-1969 Dried shark fins
- 5472-1969 Fish maws
- 5734-1970 Sardine oil
- 5735-1970 Recommendations for maintenance of cleanliness in fish industry
- 5736-1970 Dry-salted surai (*Tuna*)
- 6032-1971 Mackerel, fresh
- 6033-1971 Mackerel, frozen
- 6121-1971 Lactarius spp, canned in oil
- 6122-1971 Seer fish (*Scomberomorus* spp.), frozen
- 6123-1971 Seer fish (*Scomberomorus* spp.), fresh
- 6677-1972 Sardines (*Sardinella* sp) canned in brine and in their juice
- 7143-1973 Crab meat canned in brine
- 7313-1974 Glossary of important fish species of India
- 7581-1975 Basic requirements for fresh-fish stalls
- 7582-1975 Crab meat, solid packed
- 8076-1976 Frozen cuttle fish and squid
- 8077-1976 Procedure for checking temperature of quick frozen foods
- 8082-1976 Basic requirements for a fish market

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117/418 B Sarvodaya Nagar	KANPUR 208005	82 72
B.C.I. Bldg (3rd Floor), Gandhi Maidan East	PATNA 800004	5 36 55
Hantex Bldg (2nd Floor), Rly Station Road	TRIVANDRUM 695001	32 27